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THE

FARMER'S INSTRUCTOR,

&c. &c.

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THE

FARMER'S INSTRUCTOR,

FOR THE

PLANTING AND MANAGEMENT

OF

FOREST TREES.

COMPILED FOR THE USE OF

THE EARL OF CHESTERFIELD'S TENANTS,

BY

FRANCIS BLAIKIE,

PLANTER AND BAILIFF TO THE EARL OF CHESTERFIELD,
BRADBY HALL, DERBYSHIRE.

LONDON:
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THE RIGHT HONOURABLE

PHILIP EARL OF CHESTERFIELD, K.G.

&c. &c. &c.

MY LORD,

IN pursuance of your Lordship's orders, I have endeavoured to meet your wishes, by the compilation which I now lay before your Lordship; it purports to be a Treatise on Forest Tree Planting and Management, as adapted to the Farm System of Plantations. The theory contained in this Treatise is the result of observation and long experience, many years of which have been guided by your Lordship's fostering hand and kind indulgence. If I have so far succeeded in this little production as that you, my Lord, should think it worthy of attention, perhaps of approbation, I shall consider it as one of the most fortunate occurrences of my life, that I have had an opportunity of making a small return to the noble and generous hand which has bestowed so many favours on,

My Lord,

Your Lordship's
Most obedient,
And most humble servant,
FRANCIS BLAIKIE.

TO

THE TENANTRY

ON

THE EARL OF CHESTERFIELD'S ESTATES.

GENTLEMEN,

THE Earl of Chesterfield (with a view to the guidance and encouragement of his tenantry, and to enable them with more facility to understand and to fulfil the clauses contained in their several leases respecting the planting and nourishing of forest trees) ordered, that a BOOK of INSTRUCTIONS, in the form of a SHORT TREATISE on FOREST TREE PLANTING and MANAGEMENT, should be written expressly for the purpose; and that a copy thereof should be given to each of the tenants on his lordship's estates. In consequence of these orders, the following Treatise has been compiled by Francis Blaikie, planter and bailiff to the Earl of Chesterfield, at Bradby Hall, in the county of Derby.

As an introduction, it may not be improper to state, it too frequently happens *amongst farmers*, that any thing new,* is viewed with an eye of jealousy, under the idea of innovation—such illiberality is almost an insurmountable barrier against improvement; but, as the author addresses himself to a respectable body of tenantry, men possessing liberality of sentiment and enlargement of ideas, he, without hesitation, commences his Treatise, by observing, that the joint interests of landlord and tenant are intimately connected in the success of the system of Farm-Clump Planting, to the exclusion of the old system of hedge-row planting; it therefore behoves both parties to give the system *here* recommended due support. To the landlord his farm plantations become in a few years an ornamental and picturesque scenery, which he views with pleasure, contemplating the prospect of future benefit to himself and family; at the same time he is conscious of the patriotism which he evinces for his country, by the encouragement he gives to the growth and culture of useful forest timber; whilst the tenant will (by the following means) almost immediately reap the benefit of his exertions and a return for his expense.—First, by his giving encouragement to the new system of Clump Planting, he will soon be freed from the incumbrance of hedge-row trees, which, in very many respects, are injurious to farmers.—Secondly, by Clump Plantations giving the necessary shelter for cattle, which hedge-row timber could not afford!—and, thirdly, by the annual produce of thinnings and prunings from those plantations.

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* The system of Farm-Clump Planting is *here* called new, because that term is applicable to the practice in the district for which this Treatise is intended.

With a view to make this Treatise as plain as possible, and easily understood, it is divided into ten different heads or chapters, viz.—

1. SITUATION.
2. GUARDING AND FENCING.
3. DRAINING.
4. PREPARING THE GROUND.
5. CHOICE OF PROPER SORTS OF TIMBER TREES.
6. SELECTION OF PLANTS FROM THE NURSERY.
7. PROPER TIME AND METHOD OF PLANTING.
8. MANAGEMENT OF THE GROUND AFTER BEING PLANTED:
9. THINNING.
10. PRUNING.

Concluding with directions for planting of single trees, as such are frequently thought ornamental in scenery, and are also useful as shade for cattle.

I.

ON SITUATION.

THE proper situations for plantations on farms, are such places as those where the land is of the least comparative value to the farmer, viz. corners of fields, dumbles, wastes, steep banks, &c. &c. where the plough cannot conveniently pass, and where, if the ground is attempted to be brought into cultivation, it must be done with much trouble, and at great unnecessary expense.

Trees planted in such situations will generally be ornamental; they will (if proper attention is paid to their cultivation) in a very few years prove useful to the farmer, not only in sheltering cattle, &c. but also for the prunings and thinnings, which may be cut out yearly. To the landlord they will be ultimately beneficial; and (were the system to become general) would, in a few years, be of inestimable value to the country.

In contrast to *this* system view the *old one* of hedge-row planting. First, consider the little chance of young trees growing when planted in old hedge-row banks.—Secondly, the difficulty of guarding them when exposed in such situations;—and, thirdly, supposing that they at last conquer those difficulties, and arrive to be, what are sometimes called trees, but would, in general, be more properly denominated bushes; still they only serve to ruin the farmer's hedge-rows, and to injure the crops on the adjoining land, without even affording the necessary shelter for cattle. Such miserable stunted bushes cannot be considered as ornamental; the benefit to the landlord is merely nominal, and the loss to the community immense.

The size and form of plantations must be entirely guided by fancy and by local circumstances.

II.

ON GUARDING AND FENCING.

In the fencing of ground intended for plantations, particular care should be taken to have the fences made substantial, with a view to permanency; for cattle should never be admitted into woods or plantations, especially where there is underwood. When quicksets are intended for fences, care should be taken to guard them well from cattle.

In situations where hares and rabbits are plentiful, they are apt to eat the tops of the young quicks, consequently to injure their growth. The following method to prevent such depredations is simple, yet perhaps not generally known, viz. the laying a few small thorns or briers along the rows of young quicksets, will effectually prevent hares or rabbits from injuring them.

III.

ON DRAINING.

When the ground intended for planting is not perfectly sound, but shews one or more breakages of water, such water ought to be carried off by means of covered drains or soughs, according to the established practice of underground draining; in performing of which operation, attention ought to be paid to endeavour to carry the drains around the outside of the plantation, for if made inside, the roots of the trees will be apt to choke up the drains, which would be attended with very serious injury to the timber. In some cases the drains must of necessity be made inside; when that is the case, they should be cut as deep as possible, and the bottoms well filled with stones or rubbish above the set bricks or stones.

IV.

ON PREPARING THE GROUND.

The best method of preparing ground for plantations, is by deep trenching; but that is frequently thought expensive and tedious. The worst method is by only opening the hard ground and putting in the roots of the plants. The conclusion to be drawn is, that the medium between those two methods must be the most common.

If arable land is intended to be planted, it should previously be fallowed and well cleaned.

If old turf land is to be planted, and has not been previously trenched or ploughed, a round hole, about two feet diameter and eighteen inches deep, should be dug out for each plant, the turf be reversed in the bottom of the hole and the plant set thereon, having the loose earth put round its roots; the intermediate spaces of turf may be dug and set with potatoes for two or three years, without much injuring the trees. When the potatoes are taken up, all couch grass, roots, and other rubbish, should be carefully picked out.

V.

ON THE SORTS OF FOREST TREES MOST PROPER FOR FARM PLANTING.

As the selection of trees for planting must in a great measure depend upon soil, situation, and local circumstances, no general rule can be given for that purpose.

The properties of a few of the best sorts of timber trees will be here pointed out, leaving the ultimate selection to the planter, who may generally be guided in his choice, by taking a view around him, and observing the sorts thriving the best on soils and in situations similar to those he intends to plant. The sorts here recommended are oak, ash, elm, chesnut, wild cherry, beech, larch, and fir.

The properties and growth of oak are well known, and require no farther remark, than that the tree thrives best, and the timber proves most valuable, when grown on marl, clay, or strong loam, and in sheltered situations. It may be necessary to explain what is *here* meant by the term 'sheltered situation.' It implies not only deep vallies, surrounded by rocks, hills, &c. but even more elevated stations, where trees may have the advantage of shelter by their being placed in the interior of plantations, where they are surrounded by trees of a hardier nature, such as the birch, Scotch fir, mountain ash, sycamore, &c. &c.

The ash grows well on similar soils to the oak, but flourishes most where the soil is rather lighter, if moist; and, like most other valuable timber trees, it delights in sheltered situations.

The witch, or broad-leafed elm, is very hardy, and grows best on strong soils.

The narrow-leafed elm flourishes on deep loams, in dry situations, and answers better for hedge-row timber than most other trees.

The sweet, or Spanish chesnut, is a valuable timber tree, formerly grown in large quantities in England; but latterly much neglected. It flourishes best on strong dry loam or marle, in close plantations, and other sheltered situations, where it is not exposed to high winds and severe frosts, otherwise the timber is liable to prove scallowed or shaken. This timber is more durable than oak, either when under cover or when exposed to the weather.

The *horse* chesnut is very common in England: it branches more than the *Spanish*, therefore ought to be set round the outsides of plantations, partly for ornament and partly for shelter. The wood is hard, durable, and has a beautiful grain for ornamental furniture; but, like the Spanish chesnut, the timber is also liable to be scallowed or shaken.

The wild cherry is a much more valuable tree than it is generally understood to be. In pointing out its good qualities, it is necessary to state, that it is very hardy, and will flourish in woods and plantations in almost any soil and situation. It is easily propagated and cultivated by the usual methods practised in nurseries. It is of very rapid growth, and, when full grown, is of large dimensions. It may be transplanted, *with success*, from old woods to young plantations, at a much larger size than most other trees. The timber is valuable, not only when wrought up into useful and ornamental furniture, but also when it is used for out of doors purposes, where it has been known to stand, *sound and good*, for more than thirty years. On the whole, it may be asserted, with confidence, that we have few forest trees more valuable; and it is particularly so, on account of the quick return it makes for the expense of its cultivation.

The beech is very generally known; it thrives best on light dry soils: as it is not a convertible timber, and very little useful for farming purposes, it is here only recommended to be planted amongst other trees, as shelter and nurses to them, and to be occasionally cut for underwood.

The larch is now become in *deservedly* high estimation for its valuable qualities. It flourishes in most soils and situations. It is of very rapid growth, becomes of large dimensions, and makes a quick return to the planter. The timber is convertible into a great many useful purposes, and, in durability, it has been found in many instances to equal the best foreign deal.

As the convulsed state of the continent has been the cause of the present scarcity of foreign timber, consequently of its high price, so will the honest pride and true British spirit of independence be the means of encouraging the growth of British timber; and at no very distant period the British grown larch will be brought into competition with the best Petersburgh fir.

The growth of both Scotch and spruce firs is very rapid, and that upon almost any soil and in any situation; but the former species is most hardy. The timber of both sorts is convertible into very many useful purposes, and frequently supplies the place of foreign timber. When firs are planted with oaks, or other deciduous trees, for nurses, the Scotch should be planted round the outsides of the plantations, and the spruce be intermixed with the other trees.

As has been before observed, the planter must in a great measure be guided by fancy and by local circumstances in the selection of trees. It may, however, be *here* remarked, that when it is intended to plant an intermixture of trees, the following sorts will answer to be planted together, viz. on strong soils, plant oak, ash, chesnuts, wild cherry, and larch: and on light soils, plant larch, wild cherry, beech, and firs. The two sorts of elms answer best when planted each sort by themselves.

VI.

ON THE CHOICE OF GOOD PLANTS.

When land intended for planting has been properly cleaned and prepared, and in districts where rabbits and hares are scarce, the best method of raising plantations is, by sowing the forest tree seeds on the spot where they are intended to remain to grow to maturity. In that case great attention must be paid to keeping the young plants free from weeds, and every year to thin them out with care and judgment. But, as the before-mentioned method can seldom be practised with success, owing to various causes, principally to the great probability of the young plants being destroyed by hares or rabbits, it follows, that the safest and most general method must be by drawing plants from nurseries and setting them into plantations. In the selection of such plants, it is advisable to make choice of those which have been transplanted in the nursery a year or two before; to observe that they are taken up with good roots, and that they remain as short time as possible out of the ground before they are replanted.

The age of plants most proper for removing from nurseries into plantations must vary according to circumstances and to the sorts intended to be transplanted; probably from three to six years are the best ages for planting out. Elm, wild cherry, larch, and spruce fir, may be removed without danger when more than *ten* years old, while Scotch fir and beech will seldom succeed if removed when more than *six*, particularly if they have not been regularly transplanted in the nursery.

Plants are, in some respects, like the other parts of the creation; they have their natural enemies, are subject to diseases, and require the fostering hand of man, to nourish and protect them; (and *who*, but too often, misapplies the trust reposed in him). As in most cases prevention is better than cure, so in the selection of plants be sure to choose such as are free from disease and insects. Most plants are subject to have insects of some sort; but those on the larch, Scotch fir, and ash, are particularly observable, and so injurious, as generally to stagnate their growth, and not unfrequently to totally kill them. The larch and firs are often infested with a downy white insect, moving all over the plants and absorbing their juices: no effective remedy has yet been found against the ravages of those destructive insects.

The ash is subject to have a dry scaly insect adhering close to its bark, and depressing it. The best remedy for it is to cut the plants down to the ground, clean the stools well, and make choice of the best young shoots from the next year's growth.

Hares and rabbits are apt to injure young trees; particularly ash, even when the plants are of a good size. A safe preventive is by rubbing the stems over with tar; but as this method is rather expensive, a good substitute is found in a composition of kennel or cow dung, mixed with a small portion of lime; with which rub the stems of the trees, and renew it as often as necessary.

VII.

ON THE PROPER TIME AND METHOD OF PLANTING.

The time most proper for planting deciduous trees may be either in autumn, winter, or spring, according as the weather suits, and the ground in the best state to receive the plants; that is, when it is neither too wet nor too dry.

Evergreen plants succeed best when transplanted in the spring.

When tree seeds are deposited in the ground in plantations where they are intended to grow to maturity, they will have many enemies in rats, mice, birds, insects, &c.; it is therefore, in general, the safest method not to sow the seeds till spring. When that is the case, they should (in course of the preceding winter) be examined frequently to see that they are kept properly, viz. neither too dry nor too damp.

As the process of sowing is so extremely simple, it is not necessary to give directions for that purpose. Be careful to keep the ground free from weeds both *before* and *after* the plants are up.

When nursery or other trees are to be set out into plantations, the distances proper for the plants to stand apart must vary according to circumstances, the size of the plants, &c. Where the ground is good, and the plants large, they may be set thinner than when the ground is poor and the plants small; perhaps five feet distances will be found a good medium.

Irregularity in planting is preferable to straight lines, because the trees can be thinned out better; also, after thinning, the wind has less power, and does less injury to the plantation, than when the trees stand in rows.

One grand and general rule to be observed in planting, is, be careful not to set the trees too deep, but let them be re-set at the same depth they originally stood in the ground, which is denoted by the yellow bark; many plantations are ruined owing to the trees being set too deep; but few from their being set too shallow.

When a tree is to be planted, hold it upright, spread the roots in the hole, and be careful not to injure them with the spade; spread the earth well amongst, around, and over the roots, and tread the whole up firm and close, particularly where the ground is light and dry.

If the plants are tall or top-heavy, and require support, the stake should be set *firm* into the hole at the same time with the plant, so that they may be properly tied up together; as when the stakes are driven into the ground close to the trees, after being set, the roots are liable to be injured. When the trees are very large they will require to have more than one stake, and those to be set sloping to the plant.

When the planting and staking is finished, level the ground over with the spade, and make open drains, where necessary, for carrying off wet. The plantation will then appear neat, clean, sound, and dry, with every prospect of its making a suitable return to the generous hand of the planter.

In the arrangement of trees in mixed plantations, attention should be paid to select the hardiest sorts, those of least value, and such as grow with bushy heads; and set them on the outsides of the plantations, on purpose to shelter the more valuable and more tender sorts placed in the interior.

VIII.

ON THE MANAGEMENT OF THE GROUND AFTER BEING PLANTED.

WHEN tree seeds are sown in plantations, it is presumed the ground has been prepared in the manner before directed. *In that case*, no crops of grain nor of vegetables should, on any account, be raised in such plantations. Little else remains to be done in the ground management, besides keeping it free of weeds. This operation should be performed by pulling the weeds out by hand, in preference to using the hoe, which if used for that purpose, generally injures the young plants, particularly where they stand thick.

When trees are planted at the distance of from four to six feet, there will be considerable vacancies in the plantations; such spare ground may be occupied for the first two or three years, by some useful crop of grain or vegetables, without doing much injury to the young trees. Such crops, (unless the ground is very poor indeed) will pay for the whole expense of keeping the plantation free from weeds.

But in thus recommending to plant crops of vegetables, &c. amongst young trees, it must not be considered that the whole of the ground in the plantation is advised to be cropped; on the contrary, great caution must be observed in not setting or sowing the crops too near the young plants, but only *very thin* in the open spaces between them.

In plantations where the trees have been set in holes, leaving intermediate spaces of turf, such open spaces may be dug and set with potatoes for the two first years; and, if the ground is *strong*, beans may be planted for the third crop.—But if *light*, turnips or buck-wheat will answer better. If the plantation succeeds well, it will not answer to take more than three crops, as the trees will then have become sufficiently large to keep down the weeds.

When trees have been set in plantation-ground, which had previously been properly prepared by trenching or fallowing, potatoes set amongst the trees will not, in general, be found to succeed so well as when planted on turf-ground. If the prepared ground is a rich deep soil, cabbage may be planted.—If strong clay, or marl, plant beans; and if light, sow turnips or buck-wheat.

In finishing this article, it is proper to remark, that the cropping of ground in plantations is not recommended as being the best mode of culture, but only as a secondary method, under the idea, that were the cropping system not to be adopted, it would *too* frequently happen, that the digging and cleaning of plantations, would be in a great measure, if not entirely neglected.

IX.

ON THINNING.

When tree-seeds have been sown in plantations, and the plants have come up thick, the process of thinning should be commenced in the following winter.

The general rule for the first thinnings is, to leave a sufficient number of the strongest plants, and to draw the weaker ones out; *These* may be replanted into nurseries, where they can be reared for future plantations.

The thinnings will require to be continued annually, at least for the first two or three years, and care must be taken not to disturb the roots of the plants intended to remain.

When the rejected plants are of an age and size that will not answer for transplanting into nurseries, less care in taking up those plants will be necessary; and the mattock (as being a more expeditious method) may be substituted for the spade.

As the plantations become older, biennial thinnings may be substituted for annual ones. Those again succeeded by triennial selection, and so on in progression, until the trees are supposed to stand sufficiently thin to allow space for their growing to full maturity.

No definite distance can *here* be fixed upon, as being *ultimately* proper for trees to stand apart, to allow sufficient space for their growing to full maturity; much depends upon the nature of the tree, on the soil, on the situation, and other local circumstances; consequently the proper distance may vary from fifteen to fifty feet. The best of all rules is to study nature, and act accordingly.

If the plantations have succeeded to expectation, there will be but little encouragement for the growth of underwood; should, however, there be any open spaces, the stools of the deciduous trees cut down, will soon afford the necessary supply.

Thinning of plantations should always be proceeded upon with the greatest caution.—The condemned trees must be *fallen* and *taken out* with care, so as not to break the branches, or rub the bark from the stems of the remaining trees.

Thinning should also be done gradually, for a sudden exposure, by taking down too many trees at one time, would be very injurious to the plantation, and, in some instances, fatal to their future prosperity.

Whereas, when trees have been properly planted, and have had due attention paid to their culture and thinning, they will generally thrive with vigor, and nature will, in a great measure, assist in the operation which is to be treated of in the following chapter on Pruning.

X.

ON PRUNING.

As the principal value of a timber tree consists in the number of cubic feet of *clear timber* it measures in the bole or stem, it follows, that any system which can be devised and acted upon, so as to continue the tree in a vigorous growing state, and yet to increase and improve the stem, whilst it prevents the branches from proportionally increasing, must be a real improvement. It is here affirmed, that this very desirable object may be obtained by judicious pruning. To treat of which will be the purport of the following chapter.

Winter is generally the season when time and attention can best be spared for pruning plantations; that necessary operation may also be performed in summer, but should never be practised *late* in spring, when the juices are flowing.

The most proper implements for pruning, are the knife and the fine toothed saw; the goss, or bill-hook, should never be used for that purpose, as it is almost impossible to make use of it with the precision necessary for pruning young trees. The great general rule to be observed in the process of pruning is, cut *close* and *clean.*

While the shoots are young and within the power of the knife, make use of *it* for pruning, and when the branches become strong, use the *saw*, always remembering the rule, *cut close and clean to the stem.*

When the displaced branches are cut close off from the stem, the bark will in a few years heal over the wound. The wood or grain will follow the same course, and the stem of the tree will be sound, clean, and perfect.

Whereas, when the old system of leaving *snags* or stumps is followed, the injury to the tree becomes manifest, by the stump of the branch obstructing the proper course of the juices, and conducting them improperly to the support of a numerous and useless family of side-shoots springing from the stump. It sometimes happens, that the stump fails to throw out side-shoots, it then not only obstructs the proper course of the sap or juices, but it sooner decays, and by its having prevented the bark from healing over the stem, it serves as a conductor, by which wet will penetrate into the heart of the tree, and be the cause of sickness, and premature death. Another great evil arising from snag pruning is, its causing knottiness in the timber, which is entirely prevented by cutting the side-shoots clean and close off to the stem.

What has been already said in objection to the *system* of snag pruning, is equally applicable to a custom *without system*, sometimes persevered in, viz. not pruning at all.

As pruning has not been generally practised for many years past, and as some people still argue against the propriety of the system; by such it may here be asked, if pruning is so necessary to the proper cultivation of timber, how comes it that there are now standing in this kingdom, so many fine tall stemmed old trees, that do not appear to have ever been pruned.

This very rational question may be answered with propriety, by saying: there are no proofs against the assertion of those trees having been pruned; in fact, there are very substantial reasons for supposing that they have actually been so treated. For by taking a view around many gentlemen's seats, in their parks and other parts of their domains, many fine tall clear stemmed old trees are observed, which do not throw out a branch for many yards above where deer or cattle could have reached them, and it is but fair to infer, that nature has, in *such cases*, been assisted by the hand of man. Many substantial reasons could be given for supposing that the system of pruning timber trees *was understood* and *acted upon* formerly, and that it is only of later years the practice has partially fallen into disuse. But as this treatise principally relates to the management of *close plantations*, the former observation (under the head of thinning) may be reverted to, viz. when plantations are properly managed, nature will greatly *assist*, and should always *direct*, in the operation of pruning.

In giving directions for the pruning of forest tree plantations, it is proper to begin with them in their infancy; and as larch and firs require a system of management different from the other sorts of trees here mentioned, they will be treated of separately.

Young oaks, and other forest trees, are, from various causes, liable to have their leading or top shoots broken or damaged, consequently the stem will, (in the following year) throw out several side shoots; *those* will raise their heads, and seemingly contend for superiority: *nature* should then be assisted by the *pruner*, who, after selecting the best shoot, must cut off the others close to the stem of the tree, and the selected shoot becomes the leader; *which*, though it may at first have rather a crooked appearance, will probably, in a few years, grow quite straight.

When nursery, or other trees, having bushy tops, are intended to be set in plantations, let their leading shoots be first selected and cleared, and then cut off a part of their side shoots, in proportion to the quantity of roots which had been cut in taking up the plants.

When trees stand thin in plantations, they are liable to throw out over-luxuriant side-shoots.—Let those be cut off close to the stem; but the smaller side-shoots must be preserved (*in the first instance*) as they are absolutely necessary for the health and prosperity of the plant.

When the following instances occur, there must be exceptions from the general rule of cutting off luxuriant side-shoots, viz. it frequently happens in young plantations, that the leading shoots of the trees are weak, while the side-shoots from the same trees are strong.—Such appearances indicate diseases in parts of the stems above where the strong side-shoots break out. When that is the case, let the original leaders be cut off, close above where the strong shoots spring from; these will consequently become the leaders of the plants, and must be encouraged accordingly.

As plantations grow older, and the branches of the trees become intermixed, nature will assist in directing the operation of pruning. The lower and smaller branches will begin to shew very evident symptoms of weakness and decay; *then* (and not before) is the time to begin to clear the stems of the smaller branches, and as they first begin to decay from the bottom of the stem, and gradually ascend it, nature points out the rule by which the *pruner* ought to be guided; who, while he is clearing the lower branches off with his fine-toothed saw, must never forget the rule of cutting close and clear to the stem.

When forest-trees have been planted on proper soils, *managed* as has been directed, and the foregoing rules for *thinning* and *pruning* fully attended to, such trees may be drawn up to immense heights, with fine tall clear stems of proportionate girths.

On the other hand.—The bad effects of mismanagement, or rather no management at all, are but too often exhibited, and must be surveyed with *disgust* and *regret* by even a superficial observer, and that after a very slight consideration.

Very few directions, and those very simple, are necessary to be given for pruning larch and firs.

When larch or firs lose their leaders, select others in the manner before directed for other trees; but it sometimes happens that firs having lost their tops, refuse to *elect* leaders, viz. by the side shoots growing horizontal, and even rather drooping than raising their heads. When that is the case, (and the tree a very particular object) if one of the side-shoots is tied up to a brace and bound to the stem of the tree, it will generally succeed as a leader, and must be treated accordingly.

It is not necessary, and indeed highly improper, to cut off any side branches from larch or firs, before such branches begin to shew symptoms of weakness, which in due time they will do; and as with other trees, so with them; the branches begin to decay first from the bottom of the stem, gradually ascending it as the tree advances in age and height; the pruner will be guided accordingly in his operations, and nature will direct him still more plainly in clearing the stems of larch and firs, than of most other trees.

The trees intended for shelter will, in general, (owing to their being set on the outsides of plantations, where they have the advantage of room and benefit of air) throw out abundance of side-shoots or branches.

Should they grow too spiral, the leading shoots must be cut off, which will induce them to grow more bushy, as required.

Much might be said on the regenerating, renewing, and improving of mis-managed plantations of forest trees.—One remark only is sufficient to be made *here* on the subject.

When plantations of deciduous trees are in a sickly state, they may frequently be restored to health and vigor, by the simple method of cutting the plants down to the ground; this operation should be performed in spring; the ground in the plantation having been dug over in the preceding winter, will also require to be kept clean afterwards, *at least for the first season.* After the young shoots from the *stools* have had one year's growth, they will in the following winter require to be thinned; this operation answers better when the shoots are *slipped* than when they are *cut* from the stools, as by the latter mode of performing the operation, the shoots are liable to grow out again. When the young shoots are finally thinned, the old stools should be sawn off in a sloping direction, close to the basis of the young saplings or heirs.

It sometimes happens, that trees appear healthier, and are thicker in the *upper* than in the *lower* part of the stem; such deformity is occasioned by the tree being barkbound.

The remedy is easy: draw the sharp point of the knife two or three times down the stem, cutting through the bark. The operation will set the stem at liberty, and improve the general health of the plant.

ON SHADE TREES.

As single trees, when properly placed in grass grounds, are generally ornamental, and are also useful to the farmer as shade for cattle, short directions will be *here* given for the planting and management of such trees.

The choice of the sorts of trees will depend upon fancy. The broad-leaved or witch-elm, generally answers well for the purpose. It succeeds better than most other trees, when transplanted of a large size. It is of quick growth, and its widespreading branches soon afford a fine shade for cattle.

When ornament is the object, the situations or parts of the field most proper for trees to be planted upon, must depend entirely on *taste.*—When useful shade for cattle is the object, the highest and most exposed parts of the field should be made choice of, on account of the free circulation of air; where the cattle may in some degree be relieved from the pests of flies, with which *in summer* they are often infested.

The shade trees should, on no account, be ever placed *in* or *near* hedge-rows, for in such situations, neither of the intended effects could be obtained.

It is, in general, very desirable that the object expected to be derived from such trees, should be obtained as soon as possible after their being planted, consequently that the trees be transplanted of a size as large as may be likely to succeed.

In their selection let the following rules be observed, viz. trees which have been planted only a few years, and stand singly, may be transplanted with great safety; whereas those which have stood in woods or in close plantations, very seldom succeed when shifted; particularly where they are placed out singly.

When large trees are intended to be transplanted, great care will be necessary in taking them up; the larger the tree, the more care will be requisite; and where convenient, a ball of earth should be taken up with the roots.

Although only *one* or *two* trees are intended ultimately to remain in one place, yet it is advisable to plant five or six together, as they will, in the first instance, nourish and protect each other, and may afterwards be thinned out at pleasure.

The former directions for planting are applicable *here*, and need not be repeated.

The tree will require to be well supported against the effects of high winds, and be well guarded from cattle.

Very little pruning will be necessary for such trees. Should any of the boughs die, they must be cut close off to the stem.

If the trees grow too spiral, the leading shoots must be cut off; and should the side branches extend too wide, they must be cut shorter.

With very little attention or trouble, the tops of single trees may be trained to a perfect umbel, or to any other shape required.

In finishing this treatise, the writer himself takes leave of the gentlemen for whose instruction it has been compiled; by stating, that the theory may, perhaps, to some of the readers, appear too complex, and the practice recommended, too intricate to be brought into common use in the farm system of occupation. To such gentlemen it is necessary to explain, that it is not expected they will be able to follow the practice in every *minutiæ*, as directed, but that they will, as near as possible, adhere to the general system. The exact principle is pointed out with a view to prevent the practitioner from adopting, and persevering in improper methods.

Every discerning man must be aware that some effective remedy ought to be speedily adopted for ultimately supplying the increasing demand for timber in the empire; and every patriotic man will consider it as his duty to his country to lend his assistance for that purpose in the way most useful. The writer is aware that extensive plantations can only be made *with propriety* on unoccupied wastes; but he is also aware, that it is in the power of the gentlemen he now addresses, and of others in the same sphere of life, very materially to assist in the great national object, of *increasing their country's resources*, by encouraging the growth of British timber; and he is confident that their patriotism will lead them to a serious consideration of the subject treated of in the publication now put into their hands.

THE END.

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